DOCUMENT RESUME

ED 234 084 TM 830 582

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TITLE Auditing Naturalistic Inquiries: Some Preliminary Applications. Part 1: Development of the Process. Part 2: Case Study Application.
PUB DATE Apr 83
NOTE 83p.; Paper presented at the Annual Meeting of the American Educational Research Association (67th, Montreal, Quebec, April 11-15, 1983).
PUB TYPE Speeches/Conference Papers (150) -- Reports - Evaluative/Feasibility (142)

EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS Case Studies; *Evaluation Methods; Formative Evaluation; *Models; Program Development; *Reliability; Summative Evaluation; *Validity
IDENTIFIERS *Audits; *Naturalistic Research

ABSTRACT

This paper describes how a naturalistic inquirer can demonstrate rigor, or trustworthiness, and how an auditor might assess it. Looking at both inquiry products and processes, Part 1 of this paper describes how an audit may assess whether an inquiry's findings and conclusions are grounded in the raw data, and whether appropriate conventions were followed and disciplined decisions were made. Recommendations are made for the types and format of data which make an inquiry auditable, and a series of auditing procedures and guiding questions which help gauge trustworthiness criteria for confirmability and dependability. Part 2 illustrates an application of the audit model presented in Part 1. The first section contains a condensed version of an actual case writeup, which provides a context for the study being audited, and the set of auditing procedures employed. The second section contains the auditor's report presented to the auditee upon completion of the audit. (Author/PN)

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AUDITING NATURALISTIC INQUIRIES:

SOME PRELIMINARY APPLICATIONS

PART 1: DEVELOPMENT OF THE PROCESS

PART 2: CASE STUDY APPLICATION

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Paper presented at the Annual Meeting,
American Educational Research Association
Montreal, Canada, April 11-15, 1983

Printed in U.S.A.

TM 830 582

Abstract

Looking at both inquiry products and processes, auditing assesses whether an inquiry's findings and conclusions are grounded in the raw data, and whether the inquirer adhered to appropriate conventions and made unbiased (disciplined) decisions. Recommendations are made for the types and format of data which make an inquiry auditable, and a series of auditing procedures and guiding questions which help gauge trustworthiness criteria for confirmability and dependability.

Introduction[1]

Purpose

This preliminary exploration into auditing is in response to a growing interest in using the naturalistic paradigm to guide research, development, and evaluation efforts in education. This paper describes how a naturalistic inquirer can demonstrate rigor, or trustworthiness,[2] and how an auditor might assess it. The purpose of the audit is to determine whether inferences and conclusions were logically derived from unbiased data, and whether conventions within the naturalistic paradigm were followed.

The means by which users evaluate the trustworthiness of naturalistic inquiry outcomes and processes has focussed largely on the detailed descriptions by inquirers of their methods and rationales. Auditing naturalistic inquiries has been proposed as a viable contribution to existing assessments of trustworthiness by engaging the aid of an outside judge to study the products and processes represented in the inquirer's (auditee's) project documentation, and subsequently offering an opinion (Guba, 1978; 1981). Up until now, the procedures one might follow when auditing have been restricted largely to the field of accounting.

This paper takes the position that an auditor's statement or

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[1] Many of the ideas, concepts, and explanations in this paper were first developed and described in the author's doctoral research at Indiana University (Halpern, 1983).

[2] Trustworthiness is the term used by Guba (1981) and Guba and Lincoln (1982), and encompasses issues of rigor, more traditionally labelled internal validity, external validity, reliability, and objectivity (or naturalistic counterparts credibility, transferability, dependability, and confirmability). In order, these issues relate to an inquiry's "truth value," "applicability," "consistency," and "neutrality." (Guba, 1981; Guba & Lincoln, 1982).

report may add credence to an inquiry. In preparation for an audit, it is likely that the inquirer (auditee) will monitor decisions more carefully, and will maintain records which aid him/her with the management of the inquiry. This paper also takes a position which assumes cooperation between the auditor and auditee, in which they explicate roles, contextual factors and expectations prior to the audit.

Context of the Audit

In combination with other strategies to ensure trustworthiness, such as member checks (Guba, 1981; Bloor, 1978), triangulation (Webb, et al., 1966; Sevigny, 1978), and peer debriefing (Guba, 1981), auditing may provide readers and users with a measure of confidence in the inquiry outcomes. Drawing from the recent contributions explaining the naturalistic paradigm (Guba, 1978; 1981; Guba & Lincoln, 1981; 1982), the point of departure in this paper is the exploration and explication of the audit, particularly as relates to confirmability and dependability (Guba, 1981; Guba & Lincoln, 1982). Confirmability (in contrast to the traditional concept of objectivity) emphasizes confirmation of the data (as opposed to objectivity of the inquirer). Dependability (in contrast to the traditional concept of reliability) focuses on the stability of the data while tolerant of explainable instabilities (as opposed to repeatability). (Guba, 1981; Guba & Lincoln, 1982)

Differences between confirmability and dependability is largely a product-process distinction. The confirmability audit seeks to assess whether inquiry findings are grounded in the data (product), while the dependability audit determines the appropriateness of the

inquiry design and implementation, focussing on instances of undisciplined or uncontrolled bias (process).

Guba (1981) suggested that an inquirer may subject the inquiry to a confirmability audit, defining it as:

> an audit certifying that data exist in support of every interpretation and that the interpretations have been made in ways consistent with the available data. This type of audit is concerned primarily with the products of the inquiry, and requires extensive documentation. (Guba, 1981, p. 88)

Addressing the issue of dependability, Guba introduced the idea of conducting a dependability audit, with the aid of an audit trail.

> Thus, the naturalists will, during a study:
> Establish an "audit trail" that will make it possible for an external auditor to examine the processes whereby data were collected and analyzed and interpretations were made.
>
> After completion of a study naturalists will:
> Arrange for a dependability audit to be done by an external auditor--someone competent to examine the audit trail and to comment upon the degree to which procedures used fall within "generally acceptable" practice. Such a dependability audit, it should be noted, deals primarily with the processes of the inquiry. (Guba, 1981, p. 87)

Products and Processes

Expanding on the product-process capabilities (confirmability-dependability), with the aid of an audit trail, the outside auditor might judge the findings as reasonable or unreasonable interpretations of the data (product); and may judge inquiry decisions guiding both data collection and data analysis as appropriate or inappropriate (process). Because data collection and analysis constantly interact with each other during a study, differentiating the audit of products and processes may be somewhat arbitrary. As Becker (1970) observes, "further data gathering takes its direction from provisional analyses" (p. 27). The task of the auditor then should be to scrutinize the products (findings) as well as the processes used to derive them, both during the field work and after the field work is completed.

Following from these ideas, this paper will examine the concept of the audit as it might be applied to naturalistic inquiries. Extracting ideas from the literature in accounting auditing, naturalistic methods, and a recent study in which audits were applied to three naturalistic inquiries (Halpern, 1983), procedures for conducting an audit (Appendix 1) and for creating an audit trail (Appendix 2) are detailed. While they are not expected to provide all of the answers, they do suggest one way to conduct an audit, and a framework from which to build, criticize, refine, and improve the audit as a methodological tool.

Context of a Naturalistic Inquiry Audit

Introduction to Accounting Auditing

Auditing has its roots in fraud detection, and gradually

developed a focus on internal controls. As the field evolved so did a theory, which mirrored practices of the times. A classification of audit types reveals two broad categories: one concerning the reliability and validity of data, which relates both to the detection of fraud and to unintentional errors; and one concerning the adherence to certain norms, procedures, or policies, which relates to internal controls (Schandl, 1978). These are similar to the product-process distinction made earlier with respect to confirmability and dependability audits within the naturalistic paradigm.

The emphasis on scrutinizing internal controls is a practical response to the time it would take for an auditor to examine every financial transaction. An emphasis on management control can be explained by rising costs in public accounting, requests by management and owners for additional information, increasing complexity of data control problems, and the development of new information systems (Brown, 1962).

Edds (1980) summarizes the current state of the art in auditing:

> ...with the advent of more complex systems and organizations, and with the tremendous increase both in volume of sales and in numbers of employees, a wide range of new demands resulted in new concepts of internal auditing. With the consequent shift in emphasis to "operational" and "management" auditing, the functions of prevention and detection of fraud were pushed somewhat into the background. (Edds, 1980, p. 232)

Cook and Winkle (1980) concur:

> They (auditors) must be able to rely on the dependability of the accounting system with its internal controls for proper recording of transactions and the production of financial statements reflecting those events. If the internal control system does not have a certain minimum level of adequacy, no amount of auditing can compensate for its weakness. (Cook and Winkle, 1980, pp. 38-39)

Purpose, Evidence, and Technique

Three key terms guide much of the thinking about auditing: 1) purpose, 2) evidence, and 3) technique. It is essential that there exist a fit between evidence, technique, and objective (or purpose). The design of an audit employs a logic similar to that found in scientific and social inquiry. Questions are asked for which answers must be found through systematic collection of evidence (data), while using the appropriate techniques (data gathering method). Conclusions, inferences, and judgments are then based on data which support those claims.

Purpose. The purpose of any audit is defined by a specific need, and shapes its particular procedures. Since there are many different types of audits, the purpose, or objective, must match the situation:

> Every audit is organized around the purpose or goal of the audit. The purpose is the guiding star of all the following procedures. It defines the norms

to be applied and the evidence to be determined. (Schandl, 1978, p. 114)

Generally, the "prime purpose of an audit is to enhance the value of information already prepared and supplied by the auditee." (Edds, 1980, p. 5)

Edds describes four basic objectives for the audit:

1. Verification of information reported by the auditee: for example, assertions about operations and current position as expressed in financial statements and other performance status reports.
2. Evaluation of the degree of compliance with established policies, procedures, applicable legislation, etc.
3. Evaluation of the economy and efficiency with which available resources are used.
4. Evaluation of the effectiveness with which stated goals are achieved. (Edds, 1980, p. 63)

Each objective provides a focus for audits of naturalistic inquiries.

Verification of information. The first objective serves an attest function. This attest function can be likened to a naturalistic inquiry audit in two ways. First, if an inquirer tape recorded interviews, and later summarized them, the auditor can verify the accuracy of the written summaries. Second, the auditor can verify that the findings of the investigation are grounded in, or can be traced to the raw data. Both attest tasks contribute to the assessment of confirmability.

Evaluation of compliance. The second objective is a scrutiny of the system of internal controls, that is, the practices established and integrated into the system to control certain procedures (Edds, 1980, p. 68). The procedures of interest are normally those created to prevent and detect errors and fraud when recording and reporting transactions.

A parallel objective in a naturalistic inquiry audit is the assessment of the inquiry's design and implementation, particularly of elements which are supposed to ensure trustworthiness (e. g. member checks and triangulation). This task may require the auditor to focus on the ongoing and responsive inquiry processes.

Evaluation of economy and efficiency. The third objective extends beyond compliance, and requires an evaluation of the efficient use of resources. For example, the auditor attempts to locate inadequacies in management information systems, or organizational structure (pp. 70-71).

In evaluating a naturalistic inquiry, an auditor may review inquiry decisions, particularly those related to purposive sampling or the selection and utilization of data analysis strategies. For example, it would be inefficient for a naturalistic inquirer to adhere strictly to a preselected sample of respondents and list of interview questions if no new information was emerging. In another application, an inefficient analysis may result in unused data, or findings which did not explain the data clearly.

Evaluating effectiveness. The last objective suggests that an audited entity can be efficient but not effective if it does not achieve its prescribed goals (Edds, 1980, p. 75). In such

cases one may find sound, but mismatched management operations. Similarly, one may find a conflict between suborganizational and organizational goals.

An inquiry auditor might discover, for example, an inquiry that demonstrated methodological rigor, yet did not extend knowledge or further an understanding of the theories under investigation. Or, perhaps, inquiry techniques best suited to the goals were not used, yet interesting findings emerged. It is unclear whether an auditor should try to address this issue because the naturalistic inquirer is more interested in emerging outcomes than in adhering strictly to predetermined goals.

Audit Evidence

"Audit evidence" in accounting refers to any facts or information used to prove or disprove a proposition, or have an impact on the audit decision process. There are several types of evidence with varying degrees of validity, relevance, and reliability. Cook and Winkle (1980) identify seven classes of evidence.

These seven classes of evidence are comprised of various documents and records routinely kept by the organization (e.g. internal control documents, invoices, outstanding debts, and ledgers), interviews (e.g. oral statements), observations (e.g. of internal operations), and unobtrusive physical traces (e.g. physical existence of equipment). These classes of evidence are comparable to data gathered during a naturalistic inquiry. The emphasis on the review of documents and records compares to the naturalistic

inquiry auditor's emphasis on the scrutiny of audit trail records.

Audit Technique

The auditing process in accounting normally requires the auditor to trace data from financial statements back through the accounting system to the transactions that initially produced the data (Cook and Winkle, 1980). The path followed by the auditor is referred to as the audit trail. "Audit techniques" are the methods employed by an auditor to gather evidence (Cook and Winkle, 1980; Bailey, 1979).

The techniques employed should be congruent with the evidence needed. Much of what is investigated by the auditor is created by the inquirer (in the form of records and documents). Necessarily, judging validity of the documents requires a certain amount of trust.

This is a "dilemma" shared by historians. Because past events cannot be experienced by the judge (in this case, the auditor), the evidence must go beyond his or her own perceptual experiences (Mautz and Sharaf, 1961, p. 106). In determining the authenticity of a document, then, the important question is not whether the document as a whole is authentic, but rather, whether the version one has is correct and without errors arising from reproduction or other modes of transmission (Platt, 1981, p. 34). The chief factor in historical research is the human being:

> The personality of the reporter is important, for we must know whether he was in position to get

> reliable information and whether he had any mental or moral bias which would affect his report...It is necessary to find out how close he stood to the events and how well he was qualified to appreciate and state them correctly; in short, how near he comes to being an eye-witness. (Quote taken from John M. Vincent, Historical Research, New York: Peter Smith, 1929, p. 120; In Mautz and Sharaf, 1961)

By employing various evidence-gathering techniques, the auditor collects information which helps determine whether data are biased or valid, and whether computations are correct in the account balance.

Cook and Winkle (1980) identify seven audit techniques commonly used to obtain evidence appropriate to audit objectives. "Examination" (of an asset) requires the auditor to verify the item is what it is purported to be, and actually exists. "Inspection" is the review of documentary evidence to determine whether it is genuine, authentic, and corroborative of its representation in the paperwork. "Confirmation" requires the auditor to obtain a written statement from an outside authority, often to establish validity of accounts receivable. "Recomputation" assesses the accuracy of computations in the accounting system often by assessing the adequacy of internal accounting controls. "Observations" of personnel at work and the physical facilities enhance awareness of the system and may indicate deviations from prescribed procedures. "Inquiry" consists of informal conversations and interviews with personnel

to learn about business conditions, policies, and procedures. "Comparison" may reveal differences between client data and what is generally expected to be normal, particularly in areas of greatest risk of error. (Cook and Winkle, 1980, pp. 270-276)

This list of techniques provides a structure for auditing. Emphasis is placed on cross-checking the written record with whatever the record describes. The general approach is similar to structural corroboration and triangulation, techniques used by naturalistic inquirers in which convergence of information from various sources is sought (Guba, 1981).

Implications for Naturalistic Inquiry Audits

Both educational evaluation and auditing can be viewed as situation-specific applications of data-based inquiry methodology with a prime purpose of describing, then judging. If we agree that evaluation models require systematic data collection and analysis, auditing is comparable in concept and in practice, differing mainly with regard to that which is evaluated (evaluand).

In naturalistic inquiry audits, the evaluand is the design and implementation of the inquiry, and subsequent "fair representation" in the form of outcomes. The evaluand includes the process of data collection, the process of data analysis, and the write-ups of those processes. An evaluation scheme can be elaborated by examining the various components of the inquiry process and by determining how these process components can be judged in accord with criteria for rigorous inquiry techniques. The tacit

data analytic process in which the inquirer transforms raw data into findings, however, poses a problem to the inquiry auditor unmatched in the auditing literature. Prior to describing a naturalistic inquiry audit then, it will be useful first to review some of the procedures used by naturalistic inquirers when analyzing data.

Issues in Naturalistic Data Analysis

Much in the literature about inquiry addresses the logical, conceptual, and practical. Common topics include philosophies, goals, assumptions, and techniques. Many accounts of methods within the naturalistic paradigm describe techniques used to gain acceptance and trust, to select the data to be collected, and to collect data in a disciplined fashion (c.f. Wax, 1971; Burgess, 1982; Becker, 1970). This literature, however largely neglects the process of analysis. Turner (1981) states:

> ...(Researchers) are all concerned in their different ways with the basic but crucial research problems of how to record data, how to label or classify data in ways which facilitate the rearrangement of the material to reveal new properties, and how to tackle this reshuffling process. The methods used to deal with these problems have often been highly idiosyncratic, and, although the problems recur in every research project, they have seldom been thought of sufficient importance to warrant detailed discussion. (p. 229)

A systematic approach to qualitative data collection and analysis is responsive, not routine. Variations should and will occur, and can be explained in part by the theory being explicated and the preferred unit of analysis. Goetz and Le Compte (1981) elaborate:

> The unit of analysis, or what a researcher observes or counts, will differ with the purposes of the research and the form of data collected. If, for example, the data are narrative field notes collected only to identify the activities within an elementary school classroom, they may be inadequate for enumerating such things as verbal behavior, because these narrative field notes use activity as the unit of analysis, not verbal behavior (pp. 55-56).

Given different theoretical positions, data and findings may vary across researchers within a single setting. Even with similar theoretical positions, the data and findings may vary. For example, personal use of language imposes a unique structure on field notes. The language in turn is reflected in the analysis: "In doing ethnography, language structures our field notes and enters into every analysis and insight" (Spradley, 1979, p. 17).

Various constraints may influence the researcher's choice of an analytic strategy:

> These (constraints) involve prescriptions as to the kinds of data collected and the methods used, which are, in turn, predicated upon the research question itself, the interests of the researcher,

> the external and institutional constraints of time, money, and hardware and software available, and the dominant paradigms within funding agencies (Goetz and LeCompte, 1981, p. 52).

Much of the tacit and ongoing mental activity and decision making is omitted from a research report, often for practical reasons. It is time consuming and complicated to recreate complex patterns of thought. Thus, the reader is rarely exposed to the dynamic synergistic interplay of behaviors and ideas, and the subtle ways in which they influence the findings.

Analysis and Synthesis of Data

Naturalistic inquirers generally agree that when analyzing data, there is constant interplay between field notes and concepts (Glaser and Strauss, 1967; Guba, 1978; Glaser, 1978). The outcome of the analysis is a category or conceptual scheme which gives shape and meaning to the data.

Analysis and synthesis of data can be divided into five stages: 1) identifying categories, 2) developing categories, 3) establishing relationships between categories, 4) establishing relationships to existing theory, and 5) presenting the outcomes. The explication of an analytic procedure should serve as a structure within which to create an operational audit.

Identifying categories. During this stage the inquirer identifies behaviors, themes, issues, and concerns. As stated earlier, identification techniques may vary with the purpose of the research and the form of the data collected (Goetz and LeCompte, 1981). Criteria for selecting categories might include

salience, frequency, uniqueness, interest, heuristic value, and/or importance (Guba, 1978; Bulmer 1979; Guba and Lincoln, 1981). Identifying categories begins immediately upon entering the research setting, and continues during and after data are collected.

Developing categories. Next, the inquirer assigns phenomena to categories, saturates the categories, and defines new categories to accomodate the unassigned phenomena. To develop categories, the inquirer must create codes for phenomena (Glaser, 1978), establish criteria (Turner, 1981), and assign incidents to categories (Glaser, 1978). This requires interaction between the developing concepts and the data from which they arise (Bailyn, 1977). This interaction occurs during the research (e.g., identifying and exploring working hypotheses), and after data collection (e.g., when reducing the mass of field and interview notes).

Establishing relationships between categories. The inquirer must gain a broad understanding of the developing theory. The generation of theory will occur around a core category (Glaser, 1978). Establishing relationships between categories has "the prime function of 'integrating' the theory and rendering the theory 'dense' and 'saturated' as the relationships increase. These functions then lead to theoretical 'completeness'--accounting for as much variation in a pattern of behavior with as few concepts as possible thereby maximizing parsimony and scope" (Glaser, p. 93). This stage overlaps with category development and may indicate to the inquirer whether the evolving category structure is appropriate, complete, and useful.

Establishing relationships to existing theory. Newly grounded theory should be related to existing theory. Searching the literature will help determine whether the questions and propositions arising from the inquirer's data are similar or different from existing theories, or whether they constitute newer understandings.

Presenting the outcomes. Finally, the inquirer must write up the theory. The prime task of this phase is "to present the data in such a way that (their) procedures are open to the scrutiny of others" (Bailyn, 1977, p. 107). The level of complexity of the data should be geared to the reader rather than the researcher (Bailyn, 1977). The inquirer must:

> 'write conceptually,' by making theoretical statements about the relationship between concepts, rather than writing descriptive statements about people. Thus, the analyst writes in such a way as to make explicit the dimensions, properties or other theoretical codes of his theory as well as the theoretical integration of these codes. (Glaser, 1978, p. 133)

This inductive approach to generating grounded theory may vary stylistically among inquirers. Stylistic differences may be evident in the forms of raw data (interviews or observations, tapes or field notes), in recording styles of unitizing (file cards or lists), and in experience (novice or expert). All findings should be grounded in the data of the particular inquiry and the process of data collection should be guided by the emerging theory (Glaser and Strauss, 1967). The inquirer must

translate naturally occurring phenomena by framing them in a way meaningful to the reader while using the thought and language structure of the respondents. The inquiry auditor must assess the adequacy and accuracy of the inquirer's strategies, applications, and outcomes. The inquirer (auditee) must identify meaningful categories and concepts, and the assignment of phenomena to those categories in accord with explicit and precise criteria because the tasks of the inquiry auditor require scrutiny of those processes and results.

The auditing task requires an evaluation of the logic of the inferences and on the utility of the category scheme. An auditor may find such evaluations difficult, particularly when unfamiliar with the theory. Approximations about inferences and the usefulness of the reconstructed data may be made, however, through a series of guidelines developed from strategies for creating categories and analyzing qualitative data. An auditor may assess whether the inquirer 1) selected an appropriate analytic strategy, 2) consistently and appropriately applied the strategy, and 3) elaborated the outcome.

Difficulty may again surface in the assessment of auditee efficiency and economy. When tackling this problem, we may look at the differences in the processes and outcomes of a novice and an expert. In the vein of auditing, such differences may not impact upon the trustworthiness per se, but rather, upon the elegance of the description, the explanatory power of the description, and/or the contribution of knowledge to the discipline.

Summary

Auditing in accounting has provided some concepts useful for the inquiry audit. The central ideas of "objectives," "evidence," and "techniques," can guide confirmability and dependability audits. The audit focus on unintentional and intentional (fraud) errors, and on internal controls, are similar to naturalistic inquiry audit purposes of assessing whether findings are grounded in the data (error) and whether appropriate conventions were followed (internal controls).

Auditing an Inquiry

A recent study (Halpern, 1983) in which a procedure was adapted and then applied to three inquiries (Leitzman, 1980; Shapiro, 1982; Beitz, in preparation) helped explicate an auditing procedure and the necessary audit trail files. The following sections describe the basic steps an auditor might follow when conducting an audit, and the corresponding audit trail files a prospective auditee may maintain in preparation for an audit. Appendices 1 and 2 illustrate this two-part model, and detail auditor tasks, auditee tasks, guiding questions which aid the auditor in diagnosis, and referent audit trail categories where the auditor may expect to find the necessary evidence.

Pre-entry

During a three-step pre-entry, the auditor and auditee may explore alternatives. Pre-entry may require one meeting, or several, in accord with the needs of the auditee, skills of the

auditor, preparation of the audit trail, and timing of the audit. The three events comprising this phase include 1) contact by the auditee, 2) orientation to the study, and 3) assessment of audit alternatives.

Contact by auditee. The need for auditing derives from the inquiry design of the prospective auditee. Initiation by the auditee entails the arrangement of a discussion with a prospective auditor.

Discussions should help determine the need for an audit, and the availability and interest of the auditor. If the inquiry is not yet complete, or not yet begun, discussion may focus upon the auditor's preferences and needs for an audit trail.

Orientation to the study. When the documentation is complete or nearly complete, the auditee should explain the system to the auditor substantively and structurally. This will allow the auditor to become familiar with the audit trail and content, to become independent of the auditee, and to determine whether to continue.

Discuss audit alternatives. The last pre-entry step marks the first substantive go/no go decision point. The auditor and auditee must determine whether or not to continue, and under what conditions.

Auditability

During the auditability determination, the commitment to proceed requires an investment of some time and effort for the auditor. The auditor must scrutinize the audit materials and acquire a sufficient understanding of the audit trail to devise the audit plan.

Become familiar with the study. The auditee must provide the auditor with all audit materials, and clarify uncertainties. The auditor should comprehend the language, paradigm, thinking, and outcomes of the study which will serve to highlight decision points and strategies described in the audit trail.

Become familiar with the audit trail. The auditor should be able to identify and classify the audit trail components and the linkages between them. Audit notes should refer to the structure of the audit trail components in a way that promotes efficient tracking.

Determine auditability. Meeting minimal standards for auditability requires that an audit trail be sufficiently complete, comprehensible, and useful. A complete audit trail must have raw data, evidence of data reduction and analysis, evidence of data reconstruction and synthesis, process notes, statements reflecting the intentions and predispositions of the inquirer, and drafts of the instruments used.

A comprehensible audit trail enables an auditor to use the audit trail without additional explanations by the auditee. Ideally, the audit trail should be self-contained and self-explanatory. The auditor should be able to recreate the complete inquiry through the documentation.

A useful audit trail implies sufficient cross-references and linkages enabling auditor movement during tracking. Linkages highlight connections between audit trail components, and gaps in the audit trail.

Discuss auditability. Through this procedure, the auditor judges audit trail acceptability. If unacceptable, the auditor should make concrete recommendations for revision and determine whether to proceed.

Formal Agreement

Negotiate contract. A seven-step contractual process offers general guidelines, or may structure negotiations formally and explicitly. A collaborative agreement may include a timeline, goals, roles, logistical arrangements, product outcomes, format, and option scenarios for renegotiation.

Assess Trustworthiness

Assessing trustworthiness is the heart of the audit process. Assessing confirmability, dependability, and reviewing credibility engage most of the auditor's efforts.

Assessing confirmability. A comprehensive assessment of confirmability requires scrutiny of five interrelated focussing components. To judge the investigator's neutrality in interpreting events and descriptions (Guba, 1981), the auditor assesses whether 1) the findings and categories are grounded in the data, 2) the inferences are logical, 3) the category structure is useful, 4) the inquirer made efforts to control personal bias, and 5) the inquirer acknowledged, accounted for, and accomodated divergencies and discrepancies in the data.

Assessing whether findings are grounded in the data (1) requires a straightforward tracking task which verifies that the data contain the information used by the inquirer when formulating

the categories. Attesting to the existence of the data is easy when the audit trail linkages are comprehensive.

Assessing the logic of the inferences (2) is more subjective. Perhaps only a logician could claim definitive expertise. An auditor, however, can approximate logic through scrutiny of the translations made across linkages (content), and through the selection and proper implementation of analytic techniques (process). The auditor should focus on whether the inquirer's explanations about the data accurately reflect those data.

Assessing the utility of the category structure (3) relates to the problem of subjective judgment similar to that found in judgments of logic. While the logic problem estimates accuracy, utility estimates clarity, fairness, and explanatory power.

Through the category structure the inquirer proposes a plausible reconstruction of events from the raw data to the grounded theory. The usefulness of this reconstruction lies within its structure, elegance, and understanding to the reader. For example, category overlap without explanation may create confusion for the reader, as might a mixture in units or levels of analysis. While data may support each discrete finding, the findings may not help explain the theory.

Instances of bias (4) appear when the inquirer (auditee) does not take measures to control predispositions that unfairly influence the interpretations. The naturalistic inquirer normally exploits tacit qualities which subtly aid the comprehension of interactions, but must ensure that such subjective inputs are disciplined.

Assessing accomodation strategies (5) requires scrutiny of methods used to identify, account for, and explain descrepancies in the data. Through triangulation and disciplined reflexivity, the inquirer monitors and controls unwanted biases. If the introspective inquirer uncovers biases or divergent outcomes from several data sources, the auditor must ensure that the inquirer then made methodological decisions based upon such findings.

Assess dependability. A comprehensive assessment of dependability judges the overall inquiry design and ongoing methodological decisions. Scrutiny in three domains comprises dependability assessments. These include the appropriateness of the inquiry decisions and methodological shifts, the amount and frequency of bias or errors in judgment, and efforts to accomodate and integrate incidents of bias into the methodological shifts.

The auditor can approximate appropriateness of inquiry decisions from documentation illustrating a responsiveness or interaction between the inquirer and the inquiry. The auditor must look for evidence of convergence among inquiry events, hypotheses, decisions, and rationales. Unexplored hypotheses and inquiry events inconsistent with hypotheses may indicate premature closure.

Bias exists when the forces in the inquiry influence the inquirer's perceptions and decisions. and when the auditee is unaware of the interplay between forces and perceptions. Subtle forms of bias may appear in the language of the records.

Review credibility. Many inquiry techniques will enhance

credibility. The auditor may review the efforts made and the corroboration between and among strategies. Since outsiders in other roles (peer debriefers and member checkers) are better able to enhance and to verify credibility, the auditor may choose only to comment on the extensiveness and quality of those efforts.

Closure

Feedback and renegotiation. The audit process nears completion when the auditor formulates conclusions about the audited inquiry. As detailed in the contract, the auditor should present the findings prior to completing the final report. In this way, the auditee may choose to make recommended modifications, or respond to criticisms. This interaction also serves as a member check of audit accuracy, and an acknowledgement that the terms of the contract have been satisfactorily attained.

When both parties reach an agreement about closing the project, the auditor may proceed to complete the final audit report.

Preparing an Audit Trail

Creating and maintaining an audit trail requires both substantive and structural considerations. Substantive considerations include what records to maintain. Structural considerations include features such as cross-references and indexes. Appendix 2 details audit trail classes, types of files, and evidence. The following sections describe the main audit trail categories.

Audit Trail Categories

Inquiry recordkeeping is largely personal, in accord with the researcher and with inquiry needs. Recordkeeping that also serves as an audit trail should, however, possess certain characteristics.

Six categories will be described which represent one way to unitize inquiry documentation in a way useful for the auditor. These include files on: 1) raw data, 2) data reduction and analysis, 3) data reconstruction and synthesis, 4) process notes, 5) intentions and disposition, and 6) instrument development.

Raw Data

Raw data comprise the universe of information from which findings are ultimately derived. They may include interview tapes, documents, observational notes, and records, to name a few. The classification of raw data depends on the individual inquiry. For example, the researcher often transforms data while recording it, thereby filtering information prior to creating permanent records. In contrast, tape recordings represent "purer" accounts in that they reflect less interpretation. "Raw data," then, refers to data prior to formal efforts at categorization.

The particular type of raw data may influence how much confidence the auditor places in a confirmability assessment. The auditor's opinion that findings are grounded in the data is meaningful only to the extent that the data accurately reflect the phenomena under investigation. When the analysis has begun prior to the raw data entries, the connection between the findings

and data has less impact because the notetaking must be assumed accurate.

Data Reduction and Analysis

Data reduction and analysis files are created when the researcher condenses the raw data. Some common forms include summaries of field or interview notes, category labels, and statements on index cards. Even though data reduction and analysis continues throughout the inquiry, the auditee should note the distinctions between analytic files and raw data.

Two levels of notes comprise "data reduction and analysis." The first, just described, are summaries of the raw data. This unitizing tactic requires the selection of important items and exclusion of others. At a second level, the auditee should explain hunches, hypotheses, and speculations as they relate the raw data items.

Data Reconstruction and Synthesis

Evidence of reformulating the condensed data into a categorical structure or complete picture comprise "reconstruction and synthesis" files. Evidence should include descriptions of the developing categories, relationships between categories, and the relationships of categories to the existing theory. In short, these records show efforts to group and regroup the data, and to transform the data to create a new perspective or theory. This activity culminates in a final inquiry report.

Process Notes

Process notes explain the study's procedures, decisions, idiosyncracies, and rationale. When well documented, they represent the information most likely to help the auditor understand the lines of thinking during the inquiry, and least likely to appear in a published document. These notes should illustrate what the inquirer did, why, and with what effect. Three types of process notes include methodological notes, trustworthiness notes, and audit trail notes.

Methodological notes. A running account of all procedures, decisions, and strategies, each with a rationale, should be described. Notes may relate to tactics, sampling and purpose, and should describe the essential field behaviors. The auditee may choose to maintain them in separate journal entries, or integrate them with the field notes and raw data.

Trustworthiness notes. Information relating processes with outcomes of efforts to enhance trustworthiness should appear in the audit trail. For example, if the inquirer debriefs with peers, the notes should include peer inputs, reactions, revisions, and decisions from such sessions.

Audit trail notes. The substance and structure of the audit trail should be clearly labelled, and should explain the organization of the documentation.

In combination with the raw data, data reduction, and data reconstruction, the process notes should enable the auditor to "replay" the inquiry. Ideally, when the auditor reads about

a methodological choice (e.g. who to interview), s/he should be able to tell what the auditee learned (raw records), learn how the auditee conducted the interview (methodological notes), and how the auditee evaluated the interview (personal notes). The auditor may read about an analytic strategy (in the methodological notes), see the category outcome (in the reconstructed data), and compare it to discrete items in the data (reduction notes).

Intentions and Disposition

The ideas of the researcher prior to the conduct of the inquiry, the influence of relevant literature, and methodological preferences may indicate researcher biases. More importantly, they may illustrate the degree to which the researcher is aware of, and takes measures to discipline such biases.

During the inquiry, personal note entries should include reactions to decisions, research activities, and self-evaluations. Such written introspections will help the auditor sort out possible biases and determine whether the investigator responded to his/her field experiences.

Records of predictions and expectations may help the auditee as well. When compared with what actually transpired, these records will illustrate how and why the inquiry changed. Such "interactions" between the inquirer and inquiry may help the inquirer keep in touch with the study, actively think about it, and work closely with it.

Drafts of Instruments

While significantly less important than the other files, lists of interview questions, survey drafts, and observation formats illustrate changes during the life of an inquiry. They show relationships between instrumentation and categories, and the formulation of working hypotheses.

Structure of the Audit Trail

Cross-indexes, dates, and descriptions of the filing system will help the auditor use the audit trail expediently and efficiently. For example, category cards should include the interview code and page number of the raw record. The categorical structure should refer to counterpart category cards and raw records. Analytic strategies found in the process notes should illustrate the categorical structure derived from it. In short, all phases and levels of the inquiry should be referenced or linked to at least one or two other components. In this way the auditor learns about the inquiry progress from tracing raw data to analyzed data to synthesized data, using the process notes for descriptions of strategies and decisions.

Dates on all recorded entries will show the sequential relationships between linkages. During the audit, when items are removed for closer review, dates permit their replacement within the original context.

Summary

Six audit trail categories structure a way of thinking about documenting an inquiry in preparation for an audit. After

a collaborative arrangement between an auditor and auditee has been made, a twelve-step model suggests what an auditor does toward assessments of trustworthiness. Appendix 1 details the process for prospective users by describing the tasks of the auditor and auditee, listing a series of guiding criterion questions for the auditor. Appendix 2 details the types of audit trail elements which will facilitate the conduct of an audit.

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APPENDIX 1

A PROCEDURE FOR AUDITING NATURALISTIC INQUIRIES

Procedure for Auditing Naturalistic Inquiries

	Events	Auditee Tasks	Auditor Tasks	Guiding Questions for Auditor Diagnosis and Report Entries	Referent Audit Trail Categories
PRE-ENTRY	1. Contact by auditee	A. Initiate contact B. Determine need for audit C. Prepare audit trail for review	A. Determine need for audit		
	2. Orientation to the study	A. Explain recordkeeping system	A. Become familiar with audit trail B. Become familiar with content		4.C./5.A.
	3. Discuss audit alternatives				
		Decision to continue with audit unconditionally, conditionally, with a new auditor, or abandon audit			
		A. Revise audit trail as necessary			
AUDITABILITY	4. Familiarity with study	A. Arrange logistics for auditor B. Remain available for consultation	A. Identify research questions/problems		5.A.1.
			B. Identify methodological choices		5.A.2./4.A.
			1. perspective/paradigm		5.A.,C./4.A.
			2. techniques		5.A.2./4.A.
			3. rationale		5.A.,C./4.A.4.
			C. Identify theoretical framework		5.A.3.,4./2.C.1.
			D. Identify findings and conclusions		3.B.
			1. Recognize structure of categories		3.A.

(from Halpern, 1983)

Procedure for Auditing Naturalistic Inquiries

AUDITABILITY (cont.)

Events	Auditee Tasks	Auditor Tasks	Guiding Questions for Auditor Diagnosis and Report Entries	Referent Audit Trail Categories
5. Familiarity with audit trail	--	A. Identify audit trail components		4.C.1.
		B. Determine audit trail structure		4.C.2.
		C. Identify type I linkages (linkages between audit trail components)		4.C.
6. Determine auditability	--	A. Determine completeness of audit trail	Completeness (Are the following available?)	
			1. Raw data	1.A.B.C.D.
			2. Data reduction and analysis	2.A.B.C.
			3. Data reconstruction and synthesis	3.A.B.C.
			4. Process notes	4.A.B.C.
			5. Intentions and dispositions	5.A.B.C.
			6. Instrument development	6.A.B.C.
		B. Determine comprehensibility	Comprehensibility	
			1. Does the derivation of each audit trail component make sense?	4.A.,C./5.A.2.
			2. Is the audit trail self-explanatory?	4.A.,C.
			3. Does the audit trail explain the inquiry?	4.A.,C.
		C. Determine utility	Utility	
			1. Are the dates of the materials recorded?	
			2. Are materials cross-referenced?	
			3. Are materials indexed?	4.C.
			4. Are there explanations as to where each component can be found and how it was used?	4.C.
			5. Do materials show how auditee chose to collect data?	4.A./5.A.
			6. Do materials show what and from whom auditee sampled?	4.A./5.A.
			7. Do materials show how data were organized?	1.A.B.C./2.A.B.C./4.C
			8. Do materials illustrate the emerging theory?	2.C./3.A,B.

Procedure for Auditing Naturalistic Inquiries

	Events	Auditee Tasks	Auditor Tasks	Guiding Questions for Auditor Diagnosis and Report Entries	Referent Audit Trail Categories
AUDITABILITY (cont.)			D. Establish linkages	Linkages 1. Are type II linkages obvious (audit trail component linked to methodological choices)? 2. Are there gaps?	
		Discuss auditability			
		A. Revise audit trail as necessary B. Decide whether to proceed	A. Make recommendations as necessary B. Decide whether to proceed		
		Decision to continue with contract			
FORMAL AGREEMENT	7. Negotiate contract		1. Establish timeline 2. Determine goals 3. Specify roles 4. Arrange logistics 5. Determine product outcomes 6. Determine format 7. Identify renegotiation criteria		
TRUSTWORTHINESS	8. Assess confirmability	--	A. Sample findings B. Identify audit trail components linked to each finding C. verify the linkage/ connection	1. Is there isomorphism across linkages--e.g. from raw data to analyzed data to synthesized data? 2. Does the relative weighting given to categories reflect the data?	1./2./3./4.A.3. 1.A.,B.,C./3A.
	a. Assess whether findings are grounded in the data	--			

TRUSTWORTHINESS (cont.)

Procedure for Auditing Naturalistic Inquiries

Events	Auditee Tasks	Auditor Tasks	Guiding Questions for Auditor Diagnosis and Report Entries	Referent Audit Trail Categories
b. Assess whether inferences are logical	--	A. Identify analytic strategy(ies)	1. Has an appropriate analytic technique been selected?	1.A.B.C./2.C./4.A.3.,4.
		B. Assess match between strategy and data	2. Has the analytic technique been applied properly?	2.B./4.A.3./4.B.1./5.B.1.
		C. Assess application of strategy	3. Has a compatible unit of analysis been selected?	1./2.B.2./3.B.1., 3.C.1./4.A.3.
		D. Assess accuracy of the descriptions of phenomena and concepts	4. Do category labels accurately describe the concepts?	2.B./2.C./3.A.
			5. Do examples clearly explain categories?/Do category labels reflect examples?	1.A.B.C./2.B.1./3.A.B.C.
			6. Do examples fairly represent the data?	1./2.C./3.
		E. Determine whether inferences are faulty or illogical	7. Are there illogical or unsubstantiated interpretations of the data?	1./2.B.2./3.B.1./4.A.3./5.B.1.
			8. Are alternative inferences possible (alternative explanations, permutations)?	1./2.B.2.,C./3.B./4.A.3.,4./4.B./5.B.2.,C.
			9. Are there unexplained phenomena (unused data)?	1./2.C.1./3.A.,B./4.A.2.,4.,B.
c. Assess utility of category structure	--	A. Assess clarity of categorical/conceptual structure	1. Is there evidence of category overlap?	2.C./3.A.,C.2.
			2. Is there an unintended mixture of levels of analysis?	2.B.2./3.A./4.A.3.
			3. Is there an unclear method of analysis?	4.A.3.
		B. Assess explanatory power of category structure	4. Have an optimal set of categories been extracted?	1.A.B.C./2.C.1./3.A.,B.
			5. Do categories reflect the emerging working hypotheses?	2.C.1./3.A.
			6. Do categories match the theory?	3.A.,C.1./5.A.3.,4.
			7. Do categories represent an exhaustive use of the data? Support saturation?	1./2.B.,C./3.A.,C.2./4.A.2.,B.3.
		C. Assess fit between categories, definitions, and examples	8. Do categories describe phenomena at the same level?	2.B.2./3.A.1.
			9. Are categories mutually exclusive?	3.A./4.B.3.

Procedure for Auditing Naturalistic Inquiries

	Events	Auditee Tasks	Auditor Tasks	Guiding Questions for Auditor Diagnosis and Report Entries	Referent Audit Trail Categories
TRUSTWORTHINESS (cont.)	d. Assess degree and incidence of inquirer bias	--	A. Assess incidence of undisciplined subjectivity	1. Is there an imposition of inquirer's own terminology in the data?	1.B.1./2.A./3.C.2./5.C.1.
				2. Is the generation of a concept limited by the theoretical position?	3.B./5.A.,B.,C.
				3. Is there a sufficient description of the inquirer's tacit processes?	4.B./5.B.
	e. Assess accommodation strategies	--	A. Assess the design and implementation of confirmability efforts, and integration of the outcomes	1. Are there sufficient efforts to ensure confirmability?	4.A.,B.3/5.A.2.
				2. Does the inquirer account for negative evidence?	2.C./3.A.3./4.B.
				3. Does inquirer accomodate negative examples?	2.C./3.A.3./4.B.
	9. Assess dependability	--			
	a. Assess appropriateness of inquiry decisions and methodological shifts	--	A. Identify inquiry decisions B. Identify working hypotheses C. Locate audit trail entries describing inquiry processes, decisions, and rationale D. Locate support for decisions	1. Is there evidence of purposive or theoretical sampling?	2.C./4.A.2.,3.
				2. Is there support for purposive/theoretical sampling decisions?	2.C./4.A.4.
				3. Is there evidence of a systematic process for changing the instrumentation?	4.A./5.B.1./6.A.B.C.
				4. Is there support for altering techniques?	2.C./4.A.,B.2.
	b. Assess degree and incidence of inquirer bias	--	A. Identify decisions and rationale to bound the inquiry	1. Is there evidence of early closure?	2.C./4.A.2.,4./5.B.,C.1.,C.2.
				2. Are there unitized, uncategorized data?	2.B.2.,C./3.A.
				3. Is there insufficient or conflicting evidence disproving claim of saturation?	1.A.B.C./2.B./3.A.B.

Procedure for Auditing Naturalistic Inquiries

Events	Auditee Tasks	Auditor Tasks	Guiding Questions for Auditor Diagnosis and Report Entries	Referent Audit Trail Categories
TRUSTWORTHINESS (cont.)		Identify decisions and rationale to bound the inquiry (cont.)	4. Are there unexplored areas which appear in the field notes?	1.B./2.B.2./3.A.
			5. Is there unnecessarily strict adherence to an interview schedule?	1.B.1./2.C.1.,3./ 4.A.2.,3./6.A.
			6. Was the study discontinued to meet a deadline?	4.A.2./5.A.1.B.,C.
			7. Was the focus influenced by a sponsoring agency?	4.A./5.A.B.
			8. Is there a sufficient search for negative cases?	1.B./2.C./3.B./ 4.A.
		B. Identify instances which suggest cooptation	1. Are there shifts in feelings of empathy?	2.B.2./3.A.B./5.B.C.
			2. Is there an identification with figure(s) of authority in the setting?	4.A.2.,4./5.A.1.,B.
			3. Is there unused, conflicting evidence?	2.B.,C.3./3.B.
			4. Is there unexplained neglect of potential leads?	1.B./4.A./5.B.
		C. Identify whether premature judgments are made	1. Is there an overemphasis of personal notes in the analysis?	2.A.B.C./4.A.3./ 5.B.
			2. Is there an overuse of personal notes when making methodological choices?	4.A.2.,3.,4.
			3. Is there sufficient support to substantiate findings?	1.B./2.B./3.A.B./ 4.B.2.
		D. Assess whether there is a Pygmalion effect	1. Is there an unfounded convergence of personal and field notes?	1.B./2.C./5.B.
			2. Does the documentation lack a rationale for decisions?	4.A.2.,3.,4.
			3. Is there an unsubstantiated rationale for theoretical assumptions?	2.C.1./5.A.B.C.

Procedure for Auditing Naturalistic Inquiries

	Events	Auditee Tasks	Auditor Tasks	Guiding Questions for Auditor Diagnosis and Report Entries	Referent Audit Trail Categories
TRUSTWORTHINESS (cont.)			Pygmalion effect (cont.)	4. Is there a smooth convergence of preliminary questions and categories of outcomes?	2.B./3.A./5.A.1./ 6.A.B.C.
			E. Assess whether there is a Hawthorne effect	1. Is there an unexplained similarity in language between respondents and the initial theoretical position?	1.B./5.A.B.C./ 6.A.B.C.
			F. Determine whether the inquirer is biased through naivete		5.B.1.,2.
			G. Determine appropriateness of sampling decisions	1. Has a homogeneous sample been selected? 2. Is there a relationship between working hypotheses and selection of sources?	2.C./4.A. 2.C./4.A.,B.
			H. Identify the prevalence of triangulation	1. Is there an unbalanced reliance on one method? 2. Is there a connection between working hypotheses and selection of sources?	4.A.,B.1./5.A.1. 2.C./4.A.,B.1.
	c. Assess the overall design and implementation of efforts, and integration of the outcomes for dependability	--	A. Identify major design decisions B. Evaluate the rationale for design decisions	1. Are there sufficient efforts to ensure dependability? 2. Is there evidence of sufficient purposive/responsive flexibility?	4.B.2. 2.C./4.A.,B.2./ 5.B

Procedure for Auditing Naturalistic Inquiries

	Events	Auditee Tasks	Auditor Tasks	Guiding Questions for Auditor Diagnosis and Report Entries	Referent Audit Trail Categories
TRUSTWORTHINESS (cont.)	10. Review credibility	--			
	a. Assess the design and implementation of the strategies, and the integration of the outcomes	--	A. Look for evidence of triangulation B. Look for evidence of peer debriefing C. Look for evidence of member checks	1. Is there evidence of triangulation? 2. Is there evidence of member checking? 3. Is there evidence of preliminary validations (ongoing member checks)? 4. Is there evidence of peer debriefing? 5. Are the raw data isomorphic with phenomena under investigation?	3.B./4.A.1.,B.1./5.A.2. 4.B. 4.B./5.B. 4.B. 1./4.B./6.A.
	b. Assess corroboration between descriptions of methodological choices, data sources, findings, and audit trail	--		1. Is there evidence of responsive flexibility?	4.A.2.,4.B./5.B.1., C.1.
CLOSURE	11. Feedback and renegotiation	A. Assess accuracy of auditor claims B. Assess adherence/fulfillment to contract/agreement	A. Present findings B. Discuss discrepancies and determine nature of closure		
	12. Complete agreement		A. Write final report		

APPENDIX 2

AUDIT TRAIL CATEGORIES, FILE TYPES, AND EVIDENCE

Audit Trail Categories, File Types, and Evidence

Audit Trail Classification	File Types	Evidence
1. Raw data	A. Electronically recorded materials 1. videotapes (and transcripts) 2. audiotapes (and transcripts) 3. Stenomask recordings (and specimen records and chronologs) B. Field notes 1. interview records 2. observational records C. Unobtrusive measures 1. public documents 2. private records 3. physical traces D. Survey results	a. dialogue; social interactions (and tapes) b. descriptions of phenomena, events, feelings of and by respondents c. descriptions of events, characteristics of environment, and behaviors of respondents by inquirer d. photographs e. records; flow of operations; test scores f. completed surveys g. expert testimony
2. Data reduction and analysis	A. Writeups of field notes 1. descriptions B. Summaries 1. condensed notes a. events b. behaviors 2. units of information a. themes b. behaviors c. ideas d. concerns 3. quantitative summaries C. Theoretical notes 1. working hypotheses 2. concepts 3. hunches	a. summarized transcripts b. category cards (index cards) with referent index; lists of units of information c. tally sheets; computer analyses
3. Data reconstruction and synthesis	A. Categorical structure 1. themes 2. definitions 3. relationships B. Findings and conclusions 1. interpretations 2. inferences	a. hierarchies of concepts and categories b. explanations of concepts a. explanations of hierarchies and structure

(from Halpern, 1983)

Audit Trail Categories, File Types, and Evidence

Audit Trail Classification	File Types	Evidence
Data reconstruction and synthesis (cont.)		
	C. Final report	
	1. connections to existing literature	a. completed and published documents
	2. integration of concepts, relationships, and interpretations	
4. Process notes	A. Methodological notes	
	1. procedures	a. daily activities
	2. decisions	b. decision making rules and procedures
	3. strategies	c. sampling techniques
	4. rationale	d. descriptions of emerging design
		e. explication of analytic strategy
		f. instrument development
	B. Trustworthiness notes	
	1. credibility	a. peer debriefing interactions
	2. dependability	b. member checks, interactions, and calculations
	3. confirmability	c. triangulation reactions
		d. prolonged engagement and role
		e. process for selection of auditor, peer debriefer, and member checker
	C. Audit trail notes	
	1. substance of trail	a. indexes
	2. structure of trail	b. dates
		c. cross-references
		d. linkages
5. Intentions and disposition	A. Proposal	
	1. goals, objectives, and inquiry questions	a. written document
	2. intended methodology	b. bibliography
	3. relevant literature	
	4. information on current theory	
	B. Personal notes	
	1. reflexive notes	a. self-evaluation and criticism
	2. motivations	b. theoretical preferences
	C. Expectations	c. methodological preferences
	1. predictions	d. doubts
	2. intentions	

Audit Trail Categories, File Types, and Evidence

Audit Trail Classification	File Types	Evidence
6. Instrument development	A. Pilot/preliminary schedules of questions B. Observation formats C. Surveys	a. rough drafts b. final product c. feedback notes

AUDITING NATURALISTIC INQUIRIES:

SOME PRELIMINARY APPLICATIONS

PART 2: CASE STUDY APPLICATION

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Paper presented at the Annual Meeting,
American Educational Research Association
Montreal, Canada, April 11-15, 1983

Printed in U.S.A.

Introduction

The following case study report illustrates a practical application of the audit model presented in Part 1. The first section is a condensed version of an actual case writeup, and serves to provide a context for the entity being audited, and the set of auditing procedures employed.

The second part contains the auditor's report presented to the auditee upon completion of the audit.

Background of the Case Study

In Summer 1982, an audit was conducted on a study about interorganizational arrangements (Beitz, in preparation).

Aims of the Audit

The audit sought to meet the following goals:

1. To provide the auditee with a written statement assessing the degree to which:
   a. the conduct of the audited inquiry conformed to the stated intentions prior to the implementation, and the methodological descriptions advanced during the inquiry.
   b. the documentation system served as a useful audit trail.
2. To provide the auditor with an inquiry and audit trail to determine:
   a. how an audit trail contributes to the audit process.
   b. the effects of maintaining an audit trail on the overall methodology.

Focussing questions included:

1. How did the audit trail contribute to auditability?
2. Was the evolving methodological process fairly represented?
3. Did the audit trail components illustrate sound methodological decision making?

Methods of the Audited Study

The auditee wanted her study to produce a "rich description" of an interorganizational arrangement through the perceptions and experiential characteristics of participating individuals. She argued that multiple methods would allow her to gain the necessary detail. Toward that end, her data collection techniques included interviews, document reviews, and questionnaires. She maintained extensive documentation, including a four volume research journal in which she recorded field notes, theoretical notes, methodological notes, and personal notes. She also documented meetings with her research committee with whom she discussed options and made decisions.

Documentation/Audit Trail

The auditee provided extensive documentation of the inquiry, much of which was nice to have for completeness, yet not all necessary for auditability. The inquiry documentation contained explanations for all methodological processes. These processes included decisions, phases of instrument development, process development, and presumably all intermediate working copies between decisions and the final product or process. Each audit trail item contained the date of entry, and cross reference to one or more other items. Dates allowed the auditor to learn how the inquiry unfolded over time. Cross references helped establish linkages between and among elements. An alphabetized index to the documentation illustrated the division

of audit trail elements and where they could be found in the filing system.

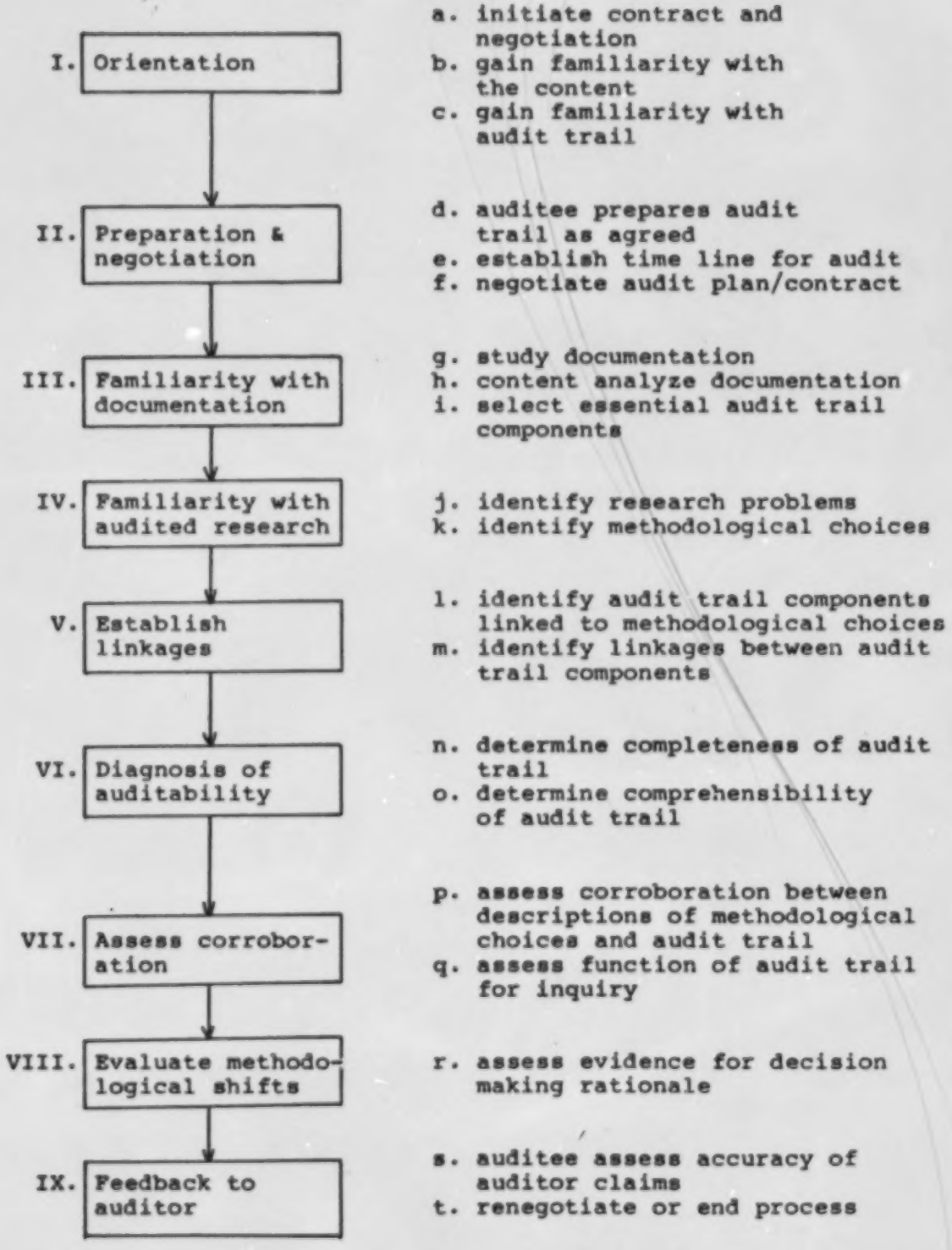
The files comprising the audit trail were grouped into four general categories: 1) structure of the inquiry progress, including the research proposal, and all raw and analyzed data, 2) explanations of the inquiry progress, including all theoretical, methodological, and personal notes, 3) data analysis process notes, including instruments and strategies, and 4) miscellaneous files, including population and sample characteristic, and other notes.

Audit Procedure

An audit procedure was developed in accord with the goals of the audit. Figure 1 illustrates the general procedure (p. 2-5). The outcomes are described in the "Case Study Audit Report" (pp. 2-6 - 2-22).

Figure 1

General Audit Procedure


I. Orientation
a. initiate contract and negotiation
b. gain familiarity with the content
c. gain familiarity with audit trail
II. Preparation & negotiation
d. auditee prepares audit trail as agreed
e. establish time line for audit
f. negotiate audit plan/contract
III. Familiarity with documentation
g. study documentation
h. content analyze documentation
i. select essential audit trail components
IV. Familiarity with audited research
j. identify research problems
k. identify methodological choices
V. Establish linkages
l. identify audit trail components linked to methodological choices
m. identify linkages between audit trail components
VI. Diagnosis of auditability
n. determine completeness of audit trail
o. determine comprehensibility of audit trail
VII. Assess corroboration
p. assess corroboration between descriptions of methodological choices and audit trail
q. assess function of audit trail for inquiry
VIII. Evaluate methodological shifts
r. assess evidence for decision making rationale
IX. Feedback to auditor
s. auditee assess accuracy of auditor claims
t. renegotiate or end process

CASE STUDY AUDIT REPORT

Introduction

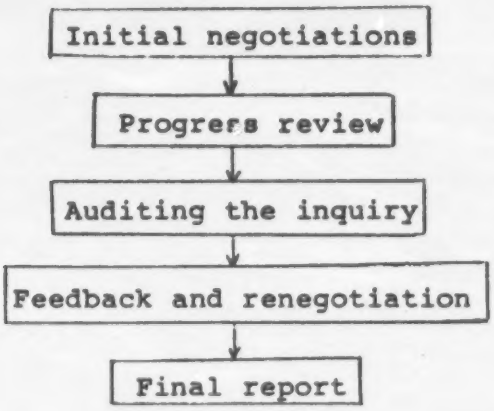
Overview

Inquiry audits assess whether a naturalistic investigator followed the canons of social science inquiry and derived inferences and conclusions logically from unbiased data. Relating this well-known accounting concept to naturalistic inquiry, Egon Guba suggested that it is reasonable for a judge to verify whether an investigator's categories make sense in view of the data and the data have been appropriately arranged into a category system. This judge might review each inquiry decision, verifying that substantively and methodologically sound options were chosen (Guba, 1978). Guba (1981) later referred to these as confirmability and dependability audits.

In this investigation, dissertation research committee members served as the primary confirmability and dependability auditors. The supplementary audit described in this report assessed auditability. Specifically, the audit assessed whether 1) the conduct of the inquiry conformed to the methodological and substantive descriptions, and 2) the documentation system served as a useful audit trail. The audit estimated what transpired during the inquiry based upon the documentation and the descriptions of the procedures in Chapter 2.

Procedures

The audit agreement emerged between my initial negotiation with the auditee and my delivery of this report. Five stages characterize the process: 1) initial negotiation, 2) progress review, 3) auditing the inquiry, 4) feedback and renegotiation, and 5) final report. The commitment to audit occurred during the first progress review.



Initial negotiations. The auditee and I met in Summer 1981, to discuss my auditing her dissertation. We focussed on the necessary documentation, and agreed to meet at a later date to review its acceptability as an audit trail (auditability).

Progress review. In December, 1981, and in March, 1982, I reviewed the documentation for auditability. By December, the auditee had completed most of the interviews and had started the analysis. The audit trail appeared self-explanatory and very well organized, therefore satisfactory for the audit. I suggested the auditee include

the interview and page number when she transferred interview items onto 3 x 5 cards to ease my efforts to trace her analytic processes.

In March we met again to review the materials and to plan specifically for the audit. We agreed to wait until the questionnaire was completed, thereby enabling an audit of all non-quantitative portions of the inquiry.

Auditing the inquiry. After the completion of the questionnaire, the audit began. I focussed, as described previously, on whether 1) the conduct of the inquiry conformed to the methodological and substantive descriptions, and 2) the documentation served as a useful audit trail.

Feedback and renegotiation. Initial feedback took place during our progress reviews, and centered on audit trail characteristics. After conducting much of the audit I described the outcomes and proposed a tentative outline for the audit report. The auditee found the outline acceptable for her dissertation. We agreed to use her review of the first draft of the final report as the member check.

Final report. The last step of the audit involved the formal writeup and presentation of this report.

Audit Outcomes

Overview

Audit findings in relation to the audit goals derived from choices about methods and the developmental inquiry process. The former focussed on checking evidence to support that the auditee did what she said she did. This relates to decisions and descriptions about sampling, interview technique, analytic techniques, questionnaire development, and efforts to ensure rigor.

The latter focussed on checking for evidence to support the rationale for inquiry decisions made in response to some inquiry activity. Specifically, this relates to the selection of an analytic technique and the selection of questionnaire items.

Twelve audit trail items aided such assessments.

1. Interview notes
2. Documents
3. Categorical analysis
4. Theoretical notes
5. Personal notes
6. Methodological notes
7. Research committee meeting and conference call notes
8. IN/CSPD meeting notes
9. IN/CSPD participant listings
10. Questionnaire and questionnaire development notes
11. Category cards
12. Dissertation proposal (later chapter on

procedures)

Choices About Methods

I isolated five instances during the life of the investigation which required a choice of methods. These choices resulted from a decision making process tailored to the goals of the research. In turn, each choice influenced the form and substance of the outcomes. Examples include sampling, interview technique, analytic techniques, rules for questionnaire item development and efforts to ensure and enhance rigor.

Sampling. As the auditee described, she chose to study the National Inservice Network (NIN) as a case example of an interorganizational arrangement (IOA). From the three participating states, she selected Indiana's IOA (IN/NIN, later referred to as IN/CSPD). From the forty participating teams, the auditee sampled interviewees purposively from key members, other involved members, project staff, and the DPI/DSE liason. I scrutinized the support documentation described in Chapter 2 (Procedures) for selecting interviewees.

To verify the sampling process, I read the files listing the participants. Support documentation included the list of Project staff, their nominations of key members, and their selection criteria. All participants nominated more than once were included on another list as were all criteria. Project staff selected ten key members from this

list.

The interview notes verified that the auditee interviewed these people. The interview notes also verified that she interviewed the four Project staff members and the DPI/DSE liason. By checking the original list of key member nominees with those actually itnerviewed, I verified that the nominees not considered key members were not among the final ten interviewees.

Methodological note entries offered a self-critique of the process. These notes describe an alternative way of dealing with the nomination process.

Questionnaire respondents comprised a self selected sample in that they opted to complete and return the questionnaires. Using the SPSS FREQUENCIES computer program output, I verified that the auditee received 89 completed surveys.

Interview technique. Copies of the actual handwritten interview notes supported the auditee's descriptions of the interview process. Each interview record included the respondent's name, interview date, and notes about the responses. The auditee highlighted the interview question by circling it in the record. Notes about responses appeared to have been added after the interview, as indicated by smaller handwriting, frequently continued on the reverse side of the page.

I found supplementary material about the interview process. The cumulative list of interview questions reflected those in the interview record. Personal note entries contained reactions to the interviews, for example, descriptions of how each interview "went," and introspections about technique.

Evidence in the audit trail supported the descriptions of the process in Chapter 2 (Procedures). Corroborating documentary evidence and journal entries which describe the interview question development and self critiques of the interview process, support the following inference. In addition to documenting the process adequately for this audit, the auditee was sensitive to her interview technique, and monitored and reflected upon her style sufficiently in journal entries. Such reflections suggested she did not lapse into undisciplined interview behaviors over time.

Analytic technique. The auditee applied heuristic strategies when analyzing the interview and the document data. To analyze the interview data she attempted topical, categorical, and signifcance analyses. The first two analytic strategies served to aid the auditee in breaking down the interviews into smaller units. The significance analysis strategy required her to rate the significance and expectation of each item. Because both the topical and categorical analyses served the same end, and since she preferred the categorical, she abandoned the topical.

I found documentation supporting her described interview analysis procedures from journal entries, category cards, and a list of collapsed categories. I found support for the documentary analysis procedures in journal entries, category cards, and the document analysis instrument. Theoretical note entries described the step by step procedure for categorizing and rating the significance, and provided examples of how the coded cards appeared. (At a later discussion with me and in a later journal entry, the auditee acknowledged that the explication of this procedure should have been included in the methodological notes. I concurred.)

The category cards appeared as she described them in the journals, complete with statement, category assignment, interview number, and in some cases, interview record page number. The collapsed category list used the same category number code, and the intervew records used the same interviewee code number. This cross-referencing permitted me to trace all entries from the category labels to examples of items and to the interview record.

I found the document analysis note cards similarly coded. I found entries in the audit trail describing the development of the document analysis instrument. Methodological note entries were introspections about the procedure, and described her tactical shift.

As the auditee described it, document category cards suggested categories similar to those from the interviews. Her newer tactics enabled her to look for idiosyncratic data from the plans, that is, plans not required as part of the initial format criteria. Methodological note journal entries and notes with committee members acknowledged the shift in tactic and rationale, and provided evidence showing committee support for the change.

Questionnaire development. The auditee mentions that she developed the questionnaire after categorizing both the interview and the document data. The auditee field-tested it with prospective respondents, and made revisions. The stated purposes included confirming existing data, testing working hypotheses, and expanding the data.

Audit trail files contain evidence of efforts to ground the survey in the most recent findings, to develop and refine the questionnaire, and to collaborate with the committee. Methodological note entries described the crieria for including interview and document categories as questionnaire items, thereby verifying the auditee's stated procedures. Further, the auditee retained drafts of four versions of the questionnaire, including responses by those participating in the field test and notes from meetings with her committee.

In addition, the auditee documented her rationale for each item, and coded whether she included the item to expand

the data, validate the data, or test a hypothesis. Furthermore, she cross-coded each item to the initial categories from the interview and document analysis data. Finally, she included a matrix which tallied frequencies for each category, divided according to its significance and the degree to which it was a surprising find.

Efforts to ensure rigor. In addition to the outside audit reported here, evidence supported efforts to ensure credibility, transferability, dependability, and confirmability. Using Guba's criteria (1981) for credibility, the evidence illustrated the auditee made efforts to employ techniques of 1) persistent observation, 2) peer debriefing, and 3) triangulation, and to collect referential adequacy materials.

1. The auditee accomodated the need for "persistent observation" in the sense that she participated in the project and knew many of the participants prior to the conduct of her study.

2. The auditee regularly "debriefed with peers." On several occasions, she documented informal sessions with colleagues who were also program participants. In addition, she conversed regularly with committee members, who, as evidenced by notes from those meetings and journal entries, provided guidance and suggested alternative strategies when they felt it was necessary.

3. She "triangulated" using three sources of data, including interviews, documents, and questionnaires. Cross-indexing and descriptions in the journals illustrated the overlapping of findings and modifications to account for discrepancies in the data.

4. The documents served the criteria of "referential adequacy" as well because the auditee compared the interview categories to the document categories and the criteria for creating the plan.

The auditee documented efforts to enhance "transferability" through the interview sampling procedure described earlier. She "sampled purposively" to reach a range of respondents. Furthermore, her personal note entries described feelings and reactions to the interviews. In doing so, the auditee recorded "thick descriptions" about the context within which she gathered the data.

To ensure "dependability," the auditee established an "audit trail," about which much of this report describes. She worked very closely with her committee, which served an inside audit function. In addition, through methodological note entries, category cards and notes from the process of constructing the questionnaire, the auditee provided more than ample documentation to enable me to mentally "recreate" the inquiry, as well as to validate some portions of it. Thorough cross-references combined with explanations in the journals enabled me to link together all facets of the

study.

To ensure "confirmability", the auditee practiced what Guba calls "reflexivity" (1981, p. 87); that is, in her personal note journal, she introspected about the process, described and evaluated alternative methods prior to selecting one, and criticized her own technique.

Finally, the auditee arranged for a confirmability audit by her research committee. Theoretical, methodological and personal note entries described the interactions, the confirmation of her processes and outcomes, and the design of strategies to resolve problems and disagreements.

Trials, errors, and shifts. The auditee's documentation illustrates responsiveness to the theory being advanced and the methods employed. The responsive evaluation literature describes the need for the researcher to be introspective and sensitive enough to the process and outcome to be able to make methodological shifts during the inquiry in response to the findings and working hypotheses.

The auditee also acted responsively to her own style and technique as a "human instrument," with the aid of her committee. This proved particularly true during the early interviews, during the interview analysis, and document analysis phases of the inquiry.

Specifically, the auditee's attempt to analyze the interview data using topical analysis and categorical analysis, lead to a decision about which proved more useful for her. The fact that she tried both before choosing one showed an active effort to find the one most useful for the data, as well as stylistically preferable.

The auditee devised an instrument to aid the document analysis. She debriefed with the committee who assisted in that process. She discovered that the instrument did not aid her investigation directly, yet she still assumed the documents could add useful data. She shifted the analytic technique to one seeking to highlight differences between CSPD plans, while illustrating a better fit with the interview data. A methodological note from 2/21 describes this phenomenon aptly.

> The interview data reflected disparate data about he concept of a core group--The CSPD plan data (after reviewing 10 plans) reflected essentially uniform data about the core group--ostensibly because it was an a priori "requirement" of the CSPD plan format.

This stimulated the following decision:

> I will now analyze the CSPD plan "format" itself in relationship to what sort of requirements exist to provoke uniformity in participant responses--and do those requirements have any relationship to traditional or alternative perspectives on interorganizational life.

The ability to recognize the need for a shift, and the selection of a new method illustrates nicely the "interaction" between the investigator and the study. In a

preordinate design she may have continued the document analysis as planned, and concluded no significant or relevant findings. By shifting methods, she demonstrated appropriateness and utility of using the emergent design.

The last instance concerns the auditee's interpretation of the study based solely on the interview data. The auditee described the study's findings by predicting the questionnaire outcomes. Convergent findings demonstrated an accurate appraisal of the study. Divergent findings would also contribute either by offering new information or suggesting a continuation of the investigation.

Conclusions

This audit focussed on whether 1) the conduct of the inquiry conformed to its methodological and substantive descriptions and 2) the documentation served as a useful audit trail. Toward making these assessments I developed and applied an audit process (Halpern, 1983). My ability to comment of the first issue depends upon the second, as the documentation is a necessary condition for the first assessment. For this reason, I have discussed the two in conjunction with one another throughout this report.

I conducted this audit on the non-quantitative portions of the inquiry and completed the audit before the final writeup of the study. Thus, my assessments focused on the integrity and accuracy in the portrayal of the method. Less

appropriate are comments about the inferences made from the data, because they were not determined at the time of this report, and because that function will be provided by the internal auditors.

I can say with confidence that the conduct of the inquiry conformed the the auditee's methodological and substantive descriptions, and I can report with confidence that the documentation served as a useful audit trail. In fact, this study contained more documentation than I needed, was clearly organized, and meticulously maintained. It would have been helpful, however, to have had a clearer indication of which interview questions from the compiled list of 82 were used for each interview. Since many were similar and because they appeared in condensed form in the raw record, it was not evident which exact questions corresponded with which interviews.

The audit trail contained all of the raw and categorized data, methodological plans and decisions, records of consultations, and personal introspections. Files included all copies of the developing instruments, with feedback from outside critics, as well as process notes describing the procedures. Finally, and vital to my scrutinizing of the documents efficiently, each file was labelled, all files were cross-indexed, and every item included a date.

Audited by Edward S. Halpern

February, 1983

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